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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/566,915	05/11/2006	Shozaburo Konishi	04703/0203963-US0	4217

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EXAMINER	
VASISTH, VISHAL V	
ART UNIT	PAPER NUMBER
1797	
MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/566,915	KONISHI ET AL.	
	Examiner	Art Unit	
	VISHAL VASISTH	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 March 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicants' response filed on 3/9/2009 amended independent claims 1, 5 and 6 and dependent claims 2 and 7 and applicants cancelled claim 9. Applicant's amendments overcame the 35 USC 103 rejection over Tinney as evidenced by Clark and the 35 USC 103 rejection over Shirohama (which is modified below in line with the amendments). Applicants filed a terminal disclaimer to obviate the nonstatutory double patenting rejection in the office action mailed on 10/07/2008 and therefore this rejection has been withdrawn. In light of applicant's arguments, discussed below, a new ground of rejection is set forth.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-8 are rejected under 35 U.S.C. 102(e) as being anticipated by Mabuchi et al., JP Publication No. 2004-347053 (hereinafter referred to as Mabuchi).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art

under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Mabuchi discloses a hard carbon coating sliding member coated with DLC (as recited in claims 1 and 5-6) having low friction characteristics under the presence of lubricating oils (as recited in claims 1 and 5-6) such as in an internal combustion engine (as recited in claim 4) (see Abstract) and method of lubricating such DLC contact surfaces (as recited in claim 5) (Para. [0051]).

The base oil component of the lubricating oils disclosed in Mabuchi comprise a GTL wax which is manufactured by the technique of having isomerized the advanced hydrocracking process or a synthetic base oil such as a polyalphaolefin (as recited in component (a) of claims 1 and 5-6) (Para. [0019]-[0020]). The base oil has a kinematic viscosity of more than 2 and less than 20 mm^2/s at 100°C (as recited in component (a) of claims 1 and 5-6) (Para. [0024]), an aromatic content of preferably 5% or less (as recited in component (a) of claims 1 and 5-6) (Para [0023]) and a sulfur content of 0.005% or less (as recited in component (a) of claims 1 and 5-6) (Para. [0022]).

The lubricant composition disclosed in Mabuchi further discloses the use of additives such as detergents including alkaline metal or alkaline-earth metal phenates and/or salicylates (as recited in component (c) of claims 1 and 5-6) (Para. [0044]), antioxidants such as alkylphenyl alpha-naphthylamine (sulfer-free ashless-antioxidant as recited in claims 2 and 7) (Para. [0045]), friction modifiers such as aliphatic series

ethers (oxygen-containing organic compound as recited in claims 3 and 8) (Para. [0047]) and preferably no zinc dithiophosphate (as recited in component (d) of claims 1 and 5-6) (Para. [0041]). Based on the discussion above with the limited amount of sulfur content in the base oil and no mandatory additives containing sulfur the composition inherently posses a sulfur content of less than 0.2 mass% as recited in component (b) of claims 1 and 5-6.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyake et al., JP Publication No. 2000-297373 (hereinafter referred to as Miyake) in view of Berlowitz et al., US Patent Application Publication No. 2002/0086803 (hereinafter referred to as Berlowitz).

Miyake discloses a lubricant (as recited in claims 1 and 5-6) and a system having a pair of DLC contacting faces being opposed to each other and moving relative to one another, wherein at least one of which is coated with a DLC film (as recited in claim1) and is suitably used in lubricating oils such as an engine and transmission oil (as recited in claims 4-5) (Para. [0001]-[0002] and [0005]).

Miyake as discussed above discloses the presence of a lubricating oil which can be used on a DLC coated surface in order to reduce the coefficient of friction. Miyake does not, however, explicitly disclose a base oil wherein at least one of a hydrocracked mineral oil, a wax-isomerized mineral oil, and a poly-alpha-olefin base oil has a kinematic viscosity of 2 to 20 mm.sup.2/s at 100° C, a total aromatic content of not higher than 5 mass %, and a total sulfur content of not higher than 0.005 mass %. Miyake also does not disclose the sulfur content of the lubricant or the additives present in the lubricant.

Berlowitz discloses a lubricant composition for an internal combustion engine (Para. [0011]) comprising an isoparaffinic hydrocarbon base stock such as Fischer-Tropsch (FT) derived base stock which undergoes hydrocracking (as recited in claims 1 and 5-6) (see Abstract and Para. [0012]-[0013]). The FT derived base oil has a kinematic viscosity of 4.83 cSt at 100°C (which is within the kinematic viscosity range as recited in claims 1 and 5-6) (Para. [0026]/Table 3), a total aromatic content of less than 0.1 wt% (within and encompassing the aromatics range as recited in claims 1 and 5-6) (Para. [0017]) and a total sulfur content of less than 1 wppm (within and encompassing the sulfur content range as recited in claims 1 and 5-6) (Para. [0017]).

The fully formulated composition of Berlowitz further discloses additives including alkali metal phenate detergents (sulfur-free metal detergent as recited in component (b) of claims 1 and 5-6) (Para. [0011]), antioxidants such as diphenyl amines (sulfur-free ashless antioxidant as recited in claims 2 and 7) (Para. [0011]), friction modifiers including glycol esters and ether amines (oxygen-containing friction modifiers as recited in claims 3 and 8) and anti-wear additives including metal phosphate (free of sulfur-containing additives selected from the group consisting of zinc dithiophosphate and sulfur-containing metal detergents as recited in component (d) of claims 1 and 5-6) (see Abstract).

Based on the discussion above with the limited amount of sulfur content in the base oil and no mandatory additives containing sulfur the composition inherently posses a sulfur content of less than 0.2 mass% as recited in component (b) of claims 1 and 5-6. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the base oil and additives of Berlowitz in the composition of Miyake in order to lower the coefficient of friction and enhance the detergency and friction properties of the composition (Para. [0028]-[0029]/Table 5 of Berlowitz).

7. Claims 1-4 and 6-8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shirahama et al., US Patent Application Publication No. 2003/0162672 (hereinafter referred to as Shirahama).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art

only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

Regarding claims 1-4 and 6-8, Shirahama discloses a low-friction sliding mechanism comprising first and second sliding members slidable relative to each other and a lubricant being applied to the sliding surfaces of the sliding members (as recited in claims 1 and 6) (see Abstract). The first sliding member is made of a diamond-like carbon material.

Shirahama discloses the use of a lubricant between the sliding members, wherein the lubricant can be a synthetic lubricant preferably a polyalphaolefin wherein the base oil has an aromatic content of preferably 8% or less, a kinematic viscosity of preferably between 2 and 20 mm^2/s, and although the sulfur content of the base oil is

not mentioned, it would be obvious to one of ordinary skill in the art at the time of the invention that the sulfur content would be below 0.005 mass%.

Shirahama does not disclose the sulfur content of the lubricant composition but since only the optional use of a sulphonated detergent and preferably 0.06% or less of ZDDP are used in the composition wherein ZDDP is not used in all compositions (as recited in component (d) of claims 1 and 6), the lubricant composition would have a sulfur content of not higher than 0.2 mass% (as recited in component (b) of claims 1 and 6). Shirahama further discloses antioxidants such as alkyldiphenylamine (Para. [0042]), friction modifiers such as aliphatic amines (Para. [0025]) and detergents such as calcium phenates (as recited in component (c) of claims 1 and 6) (Table 2). The finished lubricant of Shirahama is suitable for use in an internal combustion engine (Para. [0020].

Response to Arguments

8. Applicants' arguments with respect to claims 1-8 have been fully considered and are persuasive and therefore the 35 USC 103 rejections over Tinney in view of Yagishita has been withdrawn.

Regarding Tinney in view of Yagsihita, neither reference is drawn to friction properties associated with DLC or the lubricant composition itself. Tinney discloses load bearing characteristics and Yagishita discloses oxidative stability in the presence of water and therefore one of ordinary skill in the art would not be motivated to combine the two references to lower the coefficient of friction on a DLC coated substrate.

Regarding Shirohama, applicants argue that all of the examples comprise a sulfur-containing metal detergent and the amended claims specifically disclose free of sulfur-containing metal detergents therefore overcoming the Shirohama reference. This argument is not persuasive. The Shirohama reference discloses that the sulfonate detergents are optional additives and although these detergents are present in all of the examples, paragraph 0040 explicitly states that the composition "may" include metallic detergents.

Finally, applicants argue that the present invention provides unexpected results and point to the data in Tables 3 and 6 of the instant specification to support their position. The data, however, is not commensurate with the scope of the claims. For example, the inventive oils from the instant specification include specific hydrocracked base oils with narrow kinematic viscosities, for example base oil 1 has a kinematic viscosity of 4.0 mm^2/s which is much narrower than the range recited in claim 1. The same can be said regarding the aromatics and sulfur contents of the base oil. Example 1, base oil has an aromatic content of 1.0 mass% and a sulfur content of 0.001 mass%.

Furthermore, the additives blended with the base oil to formulate the finished composition are in very specific concentrations and are very specific compounds. For example in base oil 1, the sulfur-free metal detergent is a calcium salicylate having a TBN of 166 and a calcium content of 6.2 mass% present in a concentration of 3 mass%. Claim 1 merely recites a sulfur-free metal detergent. Also, the friction modifiers are glycerin monooleate present in a concentration of 1 mass%. Claim 1 merely recites a friction modifier consisting of at least one of an oxygen-containing organic compound

and aliphatic amines and does not include the concentrations. Finally, the sulfur-free antioxidants present in examples 5 in table 6 are specific compounds present in a concentration of 1 mass%. The same issues as discussed above can be repeated regarding the sulfur-free antioxidants. Therefore, the arguments are not persuasive to show unexpected results.

Conclusion

9. There were unused X references that were obtained from the search report. The references above disclose all of the claimed elements.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to VISHAL VASISTH whose telephone number is (571)270-3716. The examiner can normally be reached on M-R 8:30a-5:30p.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571)272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Glenn A Caldarola/
Acting SPE of Art Unit 1797

VVV